

Claims

1 1. A medical device for assisting in the drainage of fluid from a body cavity comprising:
2 an elongated member comprising a distal end and a proximal end and defining a first
3 lumen extending therebetween; and
4 a valve disposed at the proximal end of the elongated member, the valve comprising:
5 a tube defining a second lumen in fluid connection with the first lumen, the tube
6 comprising a first end connected to the proximal end of the elongated member, and a socket;
7 a shaft at least partially disposed in the socket; and
8 a stopper connected to the shaft that occludes the second lumen when exposed to
9 retrograde pressure.

1 2. The device of claim 1, wherein the shaft is fixed in the socket.
1 3. The device of claim 2, wherein the stopper comprises a deformable film.
1 4. The device of claim 1, wherein the shaft is axially translatable in the socket.
1 5. The device of claim 4, wherein the shaft is tapered inwardly toward the stopper and the
2 socket is tapered inwardly toward the stopper, both preventing complete removal of the shaft
3 from the socket.
1 6. The device of claim 4, wherein the valve further comprises a spring disposed in the
2 socket that is biased to open the valve in the absence of a retrograde pressure.
1 7. The device of claim 1, wherein the tube further defines at least one additional lumen in
2 fluid connection with the first lumen, wherein the second lumen and the additional lumen are
3 disposed about the periphery of the socket.
1 8. The device of claim 1, wherein the stopper comprises a substantially circular surface and
2 the shaft is attached to the stopper at the center of the circular surface.
1 9. The device of claim 1, wherein the stopper further comprises a lip disposed about the
2 periphery of a distal surface of the stopper.
1 10. The device of claim 1, wherein the stopper comprises a substantially hemispherical
2 surface and the shaft is attached to the stopper at the center of the hemispherical surface.
1 11. The device of claim 1, wherein the stopper comprises a substantially wedge-shaped
2 section.
1 12. The device of claim 1, wherein the device is a stent.
1 13. The device of claim 1, wherein the device is a ureteral stent.

1 14. The device of claim 1, further comprising a retention structure extending distally from the
2 distal end of the elongated member.

1 15. The device of claim 14, wherein the retention structure further defines a passageway
2 extending between an opening and the first lumen.

1 16. The device of claim 1, further comprising a retention structure extending from the
2 stopper.

1 17. The device of claim 16, wherein the retention structure is a lip disposed about a periphery
2 of the stopper having a perimeter wider than the proximal end of the elongated member.

1 18. A valve for preventing reflux of fluids in a medical device comprising:
2 a tube defining a lumen having a first end and a second end, and a socket;
3 a shaft at least partially disposed in the socket; and
4 a stopper attached to the shaft that occludes the lumen when exposed to retrograde
5 pressure.

1 19. The device of claim 18, wherein the shaft is fixed in the socket.

1 20. The device of claim 19, wherein the stopper comprises a deformable film.

1 21. The device of claim 18, wherein the shaft is axially translatable in the socket.

1 22. The device of claim 21, wherein the shaft is tapered inwardly toward the stopper and the
2 socket is tapered inwardly toward the stopper, both preventing complete removal of the shaft
3 from the socket.

1 23. The device of claim 18, wherein the valve further comprises a spring disposed in the
2 socket that is biased to open the valve in the absence of retrograde pressure.

1 24. The device of claim 18, wherein the tube further defines at least one additional lumen,
2 wherein the first lumen and the additional lumen are disposed about the periphery of the socket.

1 25. The device of claim 18, wherein the stopper comprises a substantially circular surface
2 and the shaft is attached to the stopper at the center of the circular surface.

1 26. The device of claim 18, wherein the stopper further comprises a lip disposed about the
2 periphery of a distal surface of the stopper.

1 27. The device of claim 18, wherein the stopper comprises a substantially hemispherical
2 surface and the shaft is attached to the stopper at the center of the hemispherical surface.

1 28. The device of claim 18, wherein the stopper comprises a substantially wedge-shaped
2 section.

1 29. A method of assisting the drainage of fluid from a body cavity, the method comprising:
2 providing a medical device comprising:

3 an elongated member comprising a distal end and a proximal end and defining a
4 first lumen extending therebetween; and

5 a valve disposed at the proximal end of the elongated member, the valve
6 comprising:

7 a tube defining a second lumen in fluid connection with the first lumen,
8 the tube comprising a first end connected to the proximal end of the elongated
9 member, and a socket;

10 a shaft at least partially disposed in the socket; and

11 a stopper connected to the shaft that occludes the second lumen when
12 exposed to retrograde pressure; and

13 inserting said device into a ureter.

1 30. A medical device for assisting in the drainage of fluid from a body cavity, comprising:
2 an elongated member comprising a distal end and a proximal end and defining a first
3 lumen extending therebetween;

4 a seat defined by the elongated member;

5 a shoulder defined by the elongated member proximal to the seat; and

6 a ball disposed in the elongated member between the seat and the shoulder that occludes
7 the first lumen when exposed to retrograde pressure.

1 31. The device of claim 30, wherein the elongated member defines at least one slot between
2 the seat and the shoulder.

1 32. The device of claim 30, further comprising a retention structure defining a second lumen
2 in fluid connection with the first lumen.

1 33. The device of claim 32, wherein the shoulder is defined by an interface between the
2 elongated member and the retention structure.

1 34. The device of claim 32, wherein the retention structure has a pigtail shape.

1 35. The device of claim 30, comprising a retention structure extending from the distal end of
2 the elongated member.

1 36. The device of claim 35, wherein the retention structure further defines a passageway
2 extending between an opening and the first lumen.

- 1 37. The device of claim 30, wherein the device is a stent.
- 1 38. The device of claim 30, wherein the device is a ureteral stent.
- 1 39. A method of preventing reflux of fluids in a medical device, the method comprising:
2 providing a medical device comprising:
3 an elongated member comprising a distal end and a proximal end and defining a
4 first lumen extending therebetween,
5 a seat defined by the elongated member,
6 a shoulder defined by the elongated member proximal to the seat, and
7 a ball disposed in the elongated member between the seat and the shoulder that
8 occludes the first lumen when exposed to retrograde pressure; and
9 inserting said device into a ureter.